



# ES40-12

## SPECIFICATIONS

**Nominal Voltage (V)** 12V

### Nominal Capacity

20 hour rate ( 2.25A to 10.50V )	45Ah
10 hour rate ( 4.275A to 10.50V )	42.75Ah
5 hour rate ( 7.65A to 10.20V )	38.25Ah
1C ( 45A to 9.60V )	25.5Ah
3C ( 135A to 9.60V )	18Ah

**Weight** Approx. 31.9Lbs. (14.5kg)

**Internal Resistance (at 1KHz)** Approx. 7 mΩ

**Maximum Discharge Current for 5 seconds :** 540A

### Operating Temperature Range

Charge	-15°C ( 5°F ) to 40°C (104°F )
Discharge	-15°C ( 5°F ) to 50°C (122°F )
Storage	-15°C ( 5°F ) to 40°C (104°F )

### Charge Retention (shelf life) at 20°C ( 68°F )

1 month	92%
3 months	90%
6 months	80%

### Charging Methods at 25°C ( 77°F )

**Cycle Use :** Charging Voltage 14.4 to 15.0V  
 Maximum Charging Current : 13.5A  
 Coefficient -5.0mv / °C / cell

**Standby Use :** Float Charging Voltage 13.50 to 13.80V  
 Coefficient -3.0mv / °C / cell

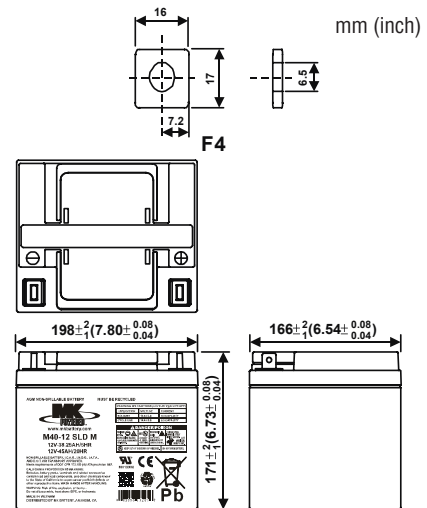
**Case Material :** ABS  
 (Option : UL94 HB Flame Retardant Case Material)

**Terminal :** F4

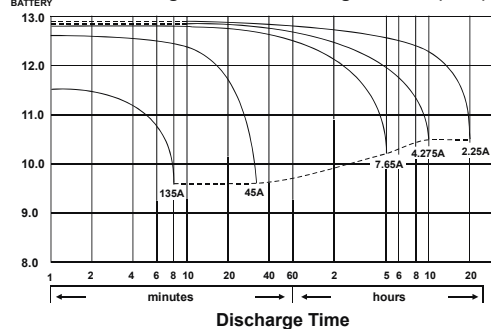
## Maintenance-Free Rechargeable Sealed Lead-Acid Battery



## DIMENSIONS



(V) FOR 12V BATTERY Discharge Time VS. Discharge Current (25°C)



## MK Battery

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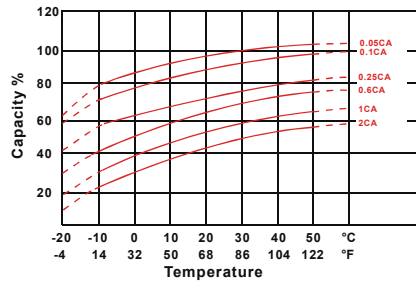
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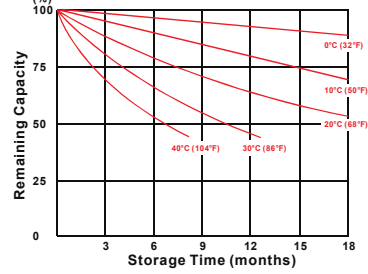


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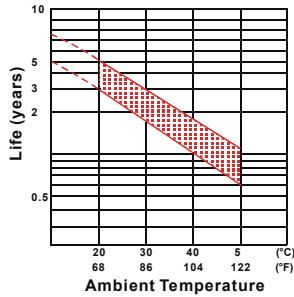
Effect of Temperature on Capacity 25°C (77°F)



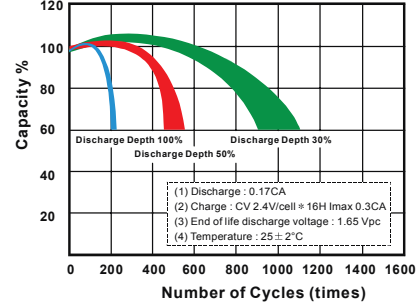
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



## - PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25°C (77°F)

Time	End Voltage	1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	233	280	314	336	341	347	354
10	min	148	178	200	214	217	221	225
15	min	116	136	150	159	162	164	167
30	min	62.0	73.0	80.5	85.4	86.5	88.1	89.4
60	min	48.8	51.8	53.6	54.9	55.3	55.9	56.4
120	min	25.7	27.3	28.2	28.9	29.2	29.5	29.7
180	min	20.5	21.8	22.5	23.1	23.2	23.5	23.7
240	min	16.4	17.4	18.0	18.4	18.7	18.8	19.0
300	min	14.0	14.9	15.4	15.7	15.9	16.0	16.2
600	min	8.23	8.74	9.04	9.26	9.35	9.44	9.52
1200	min	4.34	4.61	4.76	4.88	4.93	4.98	5.02

- Discharge Rates in Amperes to Various End Voltages at 25°C (77°F)

Time	End Voltage	1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	127	153	171	183	186	190	193
10	min	79.5	95.6	107	114	116	118	121
15	min	60.3	71.0	78.3	83.1	84.2	85.6	87.0
30	min	31.7	37.3	41.1	43.6	44.2	45.0	45.7
60	min	24.6	26.1	27.0	27.7	27.9	28.2	28.4
120	min	12.9	13.7	14.2	14.6	14.7	14.8	14.9
180	min	10.3	10.9	11.3	11.5	11.6	11.8	11.9
240	min	8.20	8.70	9.00	9.22	9.31	9.40	9.48
300	min	6.97	7.40	7.65	7.84	7.91	7.99	8.06
600	min	4.10	4.35	4.50	4.61	4.65	4.70	4.74
1200	min	2.15	2.28	2.36	2.42	2.44	2.47	2.49

All data on the spec. sheet is an average value:

The tolerance range :  $X < 6\text{min}$  (+15%~-15%),  $6\text{min} \leq X < 10\text{min}$  (+12%~-12%),  $10\text{min} \leq X < 60\text{min}$  (+8%~-8%),  $X \geq 60\text{min}$  (+5%~-5%)

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